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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/091,485	03/07/2002	Laurie S. Mittelstadt	10015155-1	9468

7590 01/20/2004

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EXAMINER	
YUAN, DAH WEI D	

ART UNIT	PAPER NUMBER
1745	

DATE MAILED: 01/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/091,485	MITTELSTADT ET AL.	
	Examiner	Art Unit	
	Dah-Wei D. Yuan	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-46* is/are pending in the application.

4a) Of the above claim(s) *11-46* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07 March 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyence. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *03072002*.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

ION EXCHANGE SYSTEM STRUCTURE WITH A MICROTEXTURED SURFACE, METHOD OF MANUFACTURE, AND METHOD OF USE THEREOF

Examiner: Yuan S.N. 10/091,485 Art Unit: 1745 January 11, 2004

Election/Restrictions

1. Applicant's election without traverse of Group I-1, claims 1-10, in Paper filed on November 24, 2003 is acknowledged. Claims 11-46 are withdrawn from consideration.

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 2 recites the limitation "near an ablation threshold of the membrane" in Line 2. It is not clear what the limitation is referred to. It is suggested to change the phrase to "near an ablation threshold of the substrate".

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-3 are rejected under 35 U.S.C. 102(b) as being anticipated by Spear, Jr. et al. (US 6,051,331).

With respect to claims 1-3, Spear, Jr. et al. teach a fuel cell system comprising a pair of bi-polar separators sandwiching an electrode membrane assembly. Each separator assembly comprises a plurality of thin plates, preferably of metal, plastic, ceramic or other suitable material into which numerous intricate microgroove fluid distribution channels have been formed, preferably by etching, but also by laser ablation, or cutting that creates through-and-partial-depth features. See Column 3, Lines 28-46.

6. Claims 1-10 are rejected under 35 U.S.C. 102(e) as being anticipated by Ruhl et al. (US 6,361,892 B1).

With respect to claims 1-3, Ruhl et al. teach a solid oxide fuel cell system comprising a solid electrolyte disposed between an oxygen electrode and a fuel electrode. Micro-channels (26) may be fabricated into the surface of electrode (13), electrolyte (10) or separator (6) by a variety of conventional subtractive techniques including laser ablation. Material can be removed from the surface of one of the layers to provide the microchannel. See Abstract; Column 6, Lines 42-49; Column 8, Lines 22-42.

With respect claims 4,5, the anode in the fuel cell preferably comprises either nickel felt or a finely divided compressed metallic powder such as nickel blended with a stable oxide powder such as zirconia. The cathode may comprise mixed ionic/electronic conductor such as

an appropriately doped perovskite oxide. Thus, the laser irradiated surface of the electrode is coated with a layer of conductive material. See Column 6, Lines 17-31.

With respect to claims 6,7, Ruhl et al. further teach the cathode or the anode may comprise a mixed conductor, optionally combined with an electronically conducting material. Examples include ceria, which can be doped with an oxide of lanthanum, zirconium or thorium, optionally containing an electronically conducting phase such as Co, Ru, or Pt. See Column 6, Lines 17-31.

With respect to claims 8,9, a paint or ink containing substantially anode material such as nickel (catalytic material) or nickel oxide may be applied to the surface of the electrolyte adjacent the anode to form the electrical contact. Column 6, Lines 1-7.

With respect to claim 10, the substrate further comprises fuel holes (18), which provide fuel to reach the catalytic material. See Column 7, Lines 38-52,

7. Claims 1-3,8,9 are rejected under 35 U.S.C. 102(e) as being anticipated by Shastri et al. (US 6,471,993 B1).

With respect to claims 1-3, Shastri et al. teach a porous polymer matrices, such as membranes, macroporous solids, and cellular solids, that are used in a wide variety of applications. Matrices including carbon powder, graphite powder, graphite fibers, metal powders, or metal fibers are useful in the production of porous electrode and/or solid-state electrolytes for battery and fuel cell applications. The porous polymer matrices may be formed

by various methods, including laser ablation. See Column 1, Lines 20-25; Column 16, Lines 52-57; Column 23, Lines 1-9; Column 26, Lines 13-18.

With respect to claims 8,9, Shastri et al. teach catalysts can be incorporated into the polymer matrices. These catalysts can be inorganic and organometallic catalysts including aluminum catalysts, nickel catalysts and zinc catalysts.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dah-Wei D. Yuan whose telephone number is (571) 272-1295. The examiner can normally be reached on Monday-Friday (8:00-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan, can be reached on (571) 272-1292. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and After Final communications.

Dah-Wei D. Yuan
January 12, 2004